SAMSUNG

DUAL LOADING WASHER

Basic Model : WF50K7500AV/A2 (WF7500K)

Model Name : WV60M9900AV (WV9900M)

Model Code : WV60M9900AV/A5 (WV9900M)

SERVICE Manual

DUAL LOADING WASHER

CONTENTS

1. Safety Instructions
2. Features and Specifications
3. Disassembly and Reassembly
4. Troubleshooting
5. PCB Diagram
6. Wiring Diagram
7. Reference

CONTENTS

1. Safety instructions 1
1-1. Safety instructions for service engineers 1

2. Features and Specifications 5
2-1. Features 5
2-2. Specifications 6
2-3. Comparing specifications with existing models 7
2-4. Options specifications 8

3. Disassembly and Reassembly 9
3-1. Tools for disassembly and reassembly 9
3-2. Standard disassembly drawings 10

4. Troubleshooting 29
4-1. Error modes 29
4-2. Test Modes 34
4-3. Corrective actions for each error code 35

5. PCB diagram 43
5-1. MAIN PCB 43
5-2. Circuit diagrams of main parts for main PBA 44
5-3 INVERTER PCB 45
5-4. Circuit diagrams of main parts for inverter PBA 46
5-5. DISPLAY PCB 47
5-6. Circuit diagrams of main parts for display PBA 48
5-7. Upper washer MAIN PCB 49
5-8. Circuit diagrams of main parts for Upper washer Main PBA 50
5-9. ScHECMATIC DIAGRAM OF Reactor & INFO 51

6. Wiring diagram 52
6-1. Wiring diagram_ WV60M9900A* 52

7. Reference 53

1. SAFETY INSTRUCTIONS

1-1. SAFETY INSTRUCTIONS FOR SERVICE ENGINEERS

▶ Be sure to observe the following instructions to operate the product correctly and safely to prevent possible accidents and hazards while servicing.

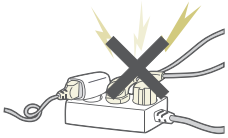
▶ Two types of safety symbols, Warning and Caution, are used in the safety instructions.

⚠ WARNING	**Hazards or unsafe practices that may result in severe personal injury or death.**
⚠ CAUTION	**Hazards or unsafe practices that may result in minor personal injury or property damage.**

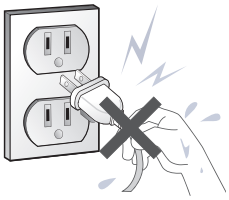
⚠ WARNING BEFORE SERVICING

- (When servicing electrical parts or harnesses) Make sure to disconnect the power plug before servicing.
  √ Failing to do so may result in a risk of electric shock.

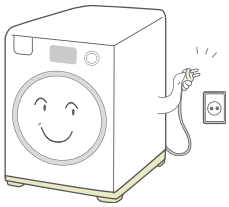
- Do not allow consumers to connect several appliances to a single power outlet at the same time.
  √ There is a risk of fire due to overheating.



- When removing the power cord, make sure to hold the power plug when pulling the plug from the outlet.
  √ Failing to do so may damage the plug and result in fire or electric shock.



- When the washing machine is not being used, make sure to disconnect the power plug from the power outlet.
  √ Failing to do so may result in electric shock or fire due to lightning.

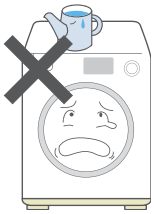


- Do not place or use gasoline, thinners, alcohol, or other flammable or explosive substances near the washing machine.
  √ There is a risk of explosion and fire caused from electric sparks.

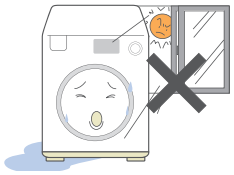
⚠ CAUTION BEFORE SERVICING

- Do not sprinkle water onto the washing machine directly when cleaning it.
  - √ This may result in electric shock or fire, and may shorten the product lifetime.

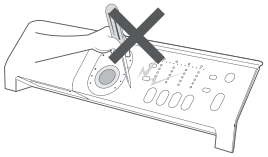
- Do not place any containers with water on the washing machine.
  - √ If the water is spilled, it may result in electric shock or fire. This will also shorten the product lifetime.



- Do not install the washing machine in a location exposed to snow or rain.
  - √ This may result in electric shock or fire, and shorten the product lifetime.



- Do not press a control button using a sharp tool or object.
  - √ This may result in electric shock or damage to the product.



⚠ CAUTION WHILE SERVICING

- When wiring a harness, make sure to seal it completely so no liquid can enter.
  - √ Make sure that they do not break when force is exerted.

- Check if there is any residue that shows that liquid entered the electric parts or harnesses.
  - √ If any liquid has entered into a part, replace it or completely remove any remaining moisture from it.

- If you need to place the washing machine on its back for servicing purposes, place a support(s) on the floor and lay it down carefully so its side is on the floor.
  - √ Do not lay it down on its front. This may result in the inside tub parts damaging.

⚠ WARNING WHILE SERVICING

- Check if the power plug and outlet are damaged, flattened, cut or otherwise degraded.
  - √ If faulty, replace it immediately.
    Failing to do so may result in electric shock or fire.

- Completely remove any dust or foreign material from the housing, wiring and connection parts.
  - √ This will prevent a risk of fire due to tracking and electrical hazard.

- When connecting wires, make sure to connect them using the relevant connectors and check that they are completely properly.
  - √ If tape is used instead of the connectors, it may cause fire due to tracking.

- Make sure to discharge the PBA power terminals before starting the service.
  - √ Failing to do so may result in a high voltage electric shock.

- When replacing the heater, make sure to fasten the nut after ensuring that it is inserted into the bracket-heater.
  - √ If not inserted into the bracket-heater, it touches the drum and causes noise and electric leakage.

⚠ WARNING AFTER SERVICING

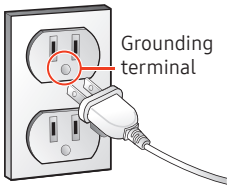
- Check the wiring.
  - √ Ensure that no wire touches a rotating part or a sharpened part of the electrical harness.

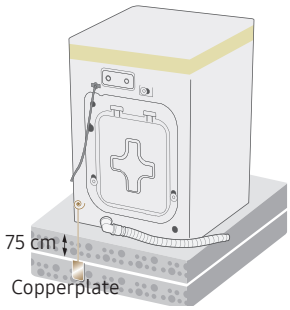
- Check for any water leakage.
  - √ Perform a test run for the washing machine course and check whether there is any water leakage through the floor section or the pipes.

- Do not allow consumers to repair or service any part of the washing machine themselves.
  - √ This may result in personal injury and shorten the product lifetime.

- If it seems that grounding is needed due to water or moisture, make sure to run grounding wires.
  (Check the grounding of the power outlet, and additionally ground it to a metallic water pipe.)
  - √ Failing to do so may result in electric shock due to electric leakage.

  [Running a grounding wire]
  - Twist a grounding wire (copper wire) two or three times around the tap.
  - If you connect the grounding wire to a copperplate, bury it 75 cm under the earth in a place with a lot of moisture.
    - ⚠ Do not connect the grounding wire to a gas pipe, plastic water pipe or telephone wire. There is a risk of electric shock or explosion.



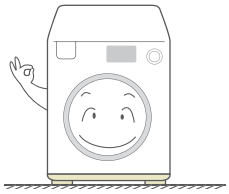


⚠ CAUTION AFTER SERVICING

- Check the assembled status of the parts.
  - √ Now is a good time to inspect your work. Review all connections and wiring, including mounting hardware.

- Check the insulation resistance.
  - √ Disconnect the power cord from the power outlet and measure the insulation resistance between the power plug and the grounding wire of the washing machine. The value must be greater than 10MΩ when measured with a 500V DC Megger.

- Check whether the washing machine is level the floor with respect to the original position of the washing machine prior to service.
  By doing this now will reduce for the need of customer dissatisfaction and redo call.
  - √ Vibrations can shorten the lifetime of the product.



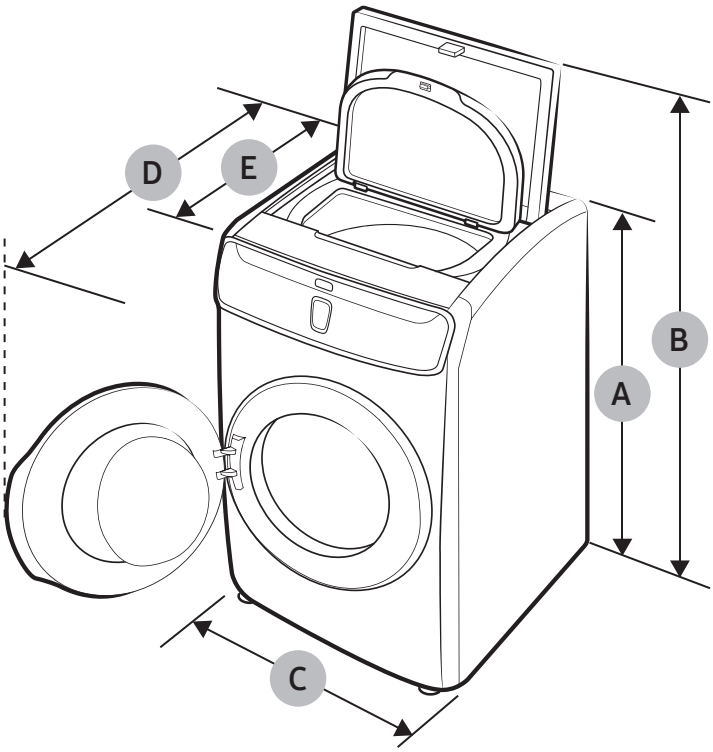
2. FEATURES AND SPECIFICATIONS

2-1. FEATURES

Features	Description
Flex Wash™	• Had to wash two loads at a time to separate lights and colors? With Dual Wash's large capacity front loader and small capacity top loader on top, you can wash separate loads at the same time. Save your time running less number of loads.
Super Speed	• The SuperSpeed feature lets you finish wash cycles up to 50% faster*, while also enhancing the cleaning performance. Powerful water jets dissolve detergent rapidly and speed up the cleaning and rinsing process.
Smart Control	• Smart Control lets you remotely control and monitor your washing from anywhere using a smartphone App*. You can start or pause it and keep an eye on program selections, the remaining time and finishing alerts.
Smart Care	• The Smart Care automatic error-monitoring system detects and diagnoses problems and provides easy troubleshooting solutions using a smartphone App*. So it saves you time and potentially expensive repair bills**.
PowerFoam™	• PowerFoam™ technology gets laundry thoroughly clean – while going easy on delicate items. It fills every inch of the drum with a thick foam that penetrates fabrics more quickly and deeply* than water and soap.
VRTplus™ (Vibration Reduction Technology)	• Innovative VRT Plus™ technology reduces noise and vibration during washes*. It keeps the drum evenly balanced even at high spin speeds and regardless of load size. So you can do your laundry anywhere and anytime.
Deep Steam	• The Deep Steam feature boosts cleaning performance and loosens grime and dirt, thus providing superior cleaning results.
Self Clean+ (Tub Cleaning cycle)	• For the ultimate in convenience, SelfClean+ technology keeps the drum and gasket hygienically clean without using cleansing agents, so it saves money. It can even notify you it needs cleaning after every 40 cycles.
Premium & Ergonomic Design	• A premium design provides an ergonomic and sophisticated look to complement any modern interior. Its natural curves incorporate an elegant chrome line and a Big Door for easier access. It also incorporates a swirl drum pattern and a control panel with a clear ice blue LED display.
DD Motor	• The power to handle anything! Our direct-drive inverter motor delivers power right to the washer tub from a variable speed, reversible motor. A beltless direct-drive motor generates a higher spin speed of 1,300 rpm for more effective, quiet operation. The washer also has fewer moving parts, meaning fewer repairs.
Pedestal with Storage Drawers (Model No : WE272*)	• An optional 15" pedestal is available to raise the washer for easier loading and unloading.

2-2. SPECIFICATIONS

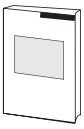
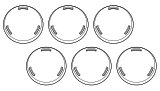
Model		WV60M9900AV	
Wash type		Dual loading washer	
Dimension (Inches / mm)	A. Height - top door closed	46.9 in. (1190 mm)	
	B. Height - top door opened	61 in. (1550 mm)	
	C. Width	27 in. (686 mm)	
	D. Depth with door open	54.6 in. (1386 mm)	
	E. Depth	34 in. (864 mm)	
Water pressure (psi (kPa))		20 - 116 (137 - 800)	
NET weight (lb (kg))		308.6 (140)	
Spin revolution	Upper washer	800 rpm	
	Lower washer	1300 rpm	
Heater rating	Washing and heating	120 V	900 W



2-3. COMPARING SPECIFICATIONS WITH EXISTING MODELS

Project		WF7500K	WV9900M	
Model Name		WF50K7500A*	WV60M9900AV/A5	
			Upper washer	Lower washer
Image				
Washing Capacity (cu.ft./ DOE)		5.0	1.0 + 5.0	
Avialable Max. Spin Speed		1300	1300 + 800	
Dimensions (W x D x H mm)	Net	686 X 864 X984	686 X 864 X1192	
	Gross	745 X 919 X 1090	750 x 915 x 1305	
Weight (kg)	Net	108	140	
	Gross	111	144	
Loading Quantity	40ft H/C (Set)	78	75	
Body Color		Black Caviar	Black Caviar	
Front Deco Strip		Chrome	Chrome	
Door Trim (Outer)		Add Door	TOC General Door	
IMEF (cu.ft/kWh/cycle)		2.92↑	1.15↑	2.92↑
IWF (gal/cycle/cu.ft)		2.9↓	12↓	2.9↓
EnergyGuide (kWh/year)		105kWh/year↓	60kWh/year↓	105kWh/year↓
Features				
PowerFoam™		●	●	
Water Shot		●	●	
Smart Control		-	●	
Smart Care (Diagnosis)		●	●	
Digital Inverter Motor		●	●	
Diamond Drum		-	-	
VRT PLUS™		●	●	
VRT™		●	●	
Steam		●	●	
Internal Drum Light		●	●	
Informative Functions				
Display		LED	LED	
LED Color		Ice Blue	Ice Blue	

2-4. OPTIONS SPECIFICATIONS

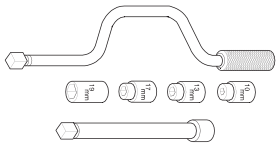
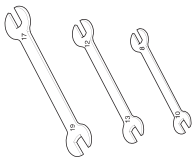
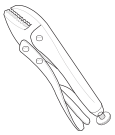
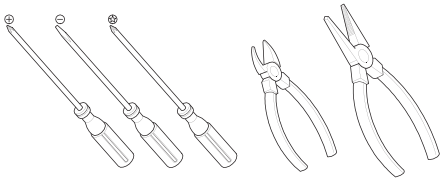
Item		Code	QTY	Remarks
	BOLT-SPANER(Wrench)	DC60-40146A	1	Default
	MANUAL USER	DC68-03768A DC68-03788A	1	Default
	CAP-FIXER	DC67-00307A	9	Default
	HOSE-HANGER	DC62-10278A	2	Default
	CABLE TIE	6501-000121	1	Default
	CASE-DETERGENT	DC61-04468A	1	Default

Note

- Customer can purchase additional water supply and drain hoses from a service center.
- The spanner(wrench), water supply and drain hoses are not supplied. Both the water supply and drain hoses are supplied during the installation.

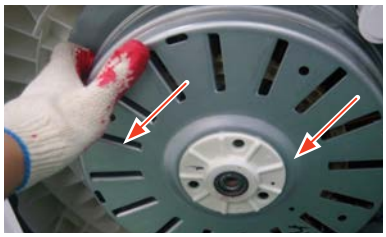
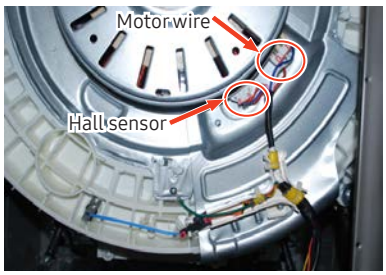
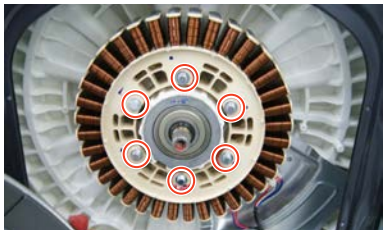
3. DISASSEMBLY AND REASSEMBLY

3-1. TOOLS FOR DISASSEMBLY AND REASSEMBLY

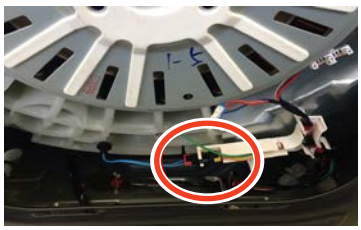
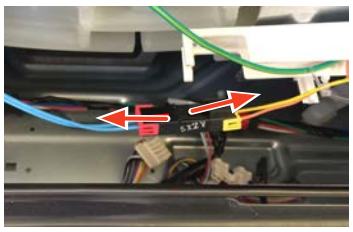
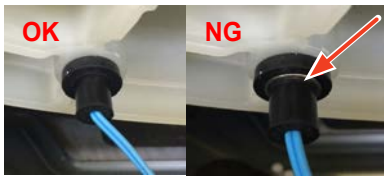
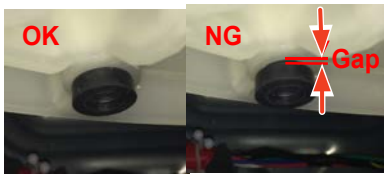
Tool		Type	Remarks
	Socket Wrench with 6” Extension	10mm 13mm 19mm	Heater (1) Motor (1), Balance (5), 2 holes of each left and right of the shock absorber 1 Pulley hole
	Open End wrench	10mm 13mm 19mm	Replaceable for the box driver. Since the bolt runs idle when the box driver is used, use the box driver 17mm.
	Vice pliers		Tool to protect the idle and abrasion of the bolt for the box driver.
	Others (Driver, Nipper, Long nose)		General tools for the after service.

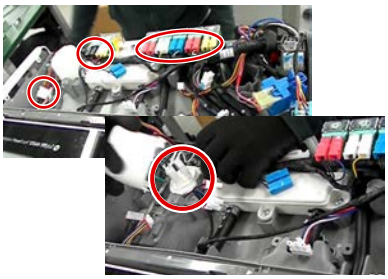
3-2. STANDARD DISASSEMBLY DRAWINGS

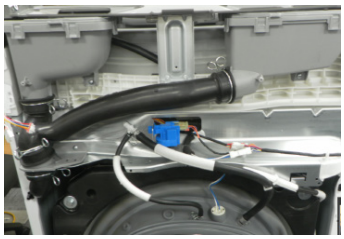
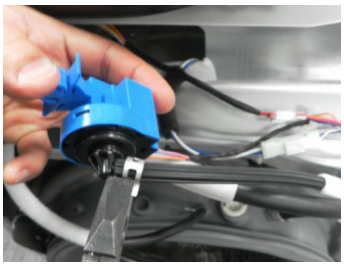
▶ This is a standard disassembly diagram and may differ from the actual product.
Use this material as a reference when disassembling and reassembling the product.

Part	Figure	Description
Disassembling and Repairing the Rear Motor		1. Remove the 2 screws holding the Back-Cover at the back of the washing machine and separate the Back-Cover pushing it downwards. (Assemble it by lifting it upwards)
		2. After separating the Back-Cover, remove the M19 nut holding the Motor. To remove it, turn it counter-clockwise. As the Motor also rotates if the nut is turned slowly, torque it quickly and firmly in a single action. Do not remove the nut by inserting a screwdriver into the Motor, as this may result in a problem with the motor.
		3. Remove the M19 nut and washer and then separate the Rotor. Since removing the rotor requires a lot of strength due to the magnetic force of the Rotor and it may come off suddenly, your hand or arm may be injured by the edge of the Stator or Frame. Therefore take precaution when separating it. You can separate the connector by pressing
		4. Separate the Motor Wire and Hall Sensor while pressing the navel of the Housing. Take precaution when you do this because the Hall Sensor part is easily shocked.
		5. Separate the 6 M10 screws. → Separate the Assy Bracket Motor → Separate the Stator. When removing the last of the 6 screws, hold the Stator as it may fall when the screws are removed.
	* **Check Points for Troubleshooting** 1. Check if there is any alien substance between the Rotor and the Stator. 2. Check if the motor power (Blue, White, Red) wire is connected. 3. Check if the Hall Sensor wire is connected. The order of the motor wires is Blue, White, and Red from the right. Check if the resistance between Blue-White, White-Red, and Red-Blue is equal to 15Ω.	

Reassembly is in the reverse order of the removal.

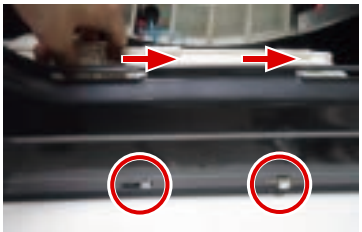
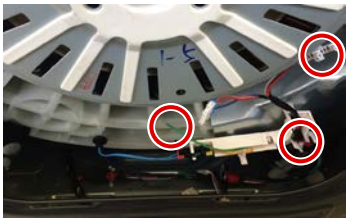
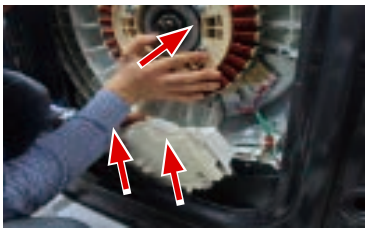
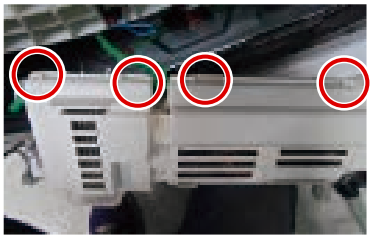
Part	Figure	Description
Disassembling and Repairing the Thermistor	 	1. Separate the Assy Thermistor and Guide Wire-T while pulling the Assy Thermistor. 2. Separate the Assy Thermistor and Assy Wire Harness while pressing the navel of the Housing.
		3. Pull the Assy Thermistor from Tub Back. When disassembling Assy Thermistor , leave the rubber packing.
	⚠ CAUTION  	1. When assembling Assy Thermistor, push to the end. If assembling like NG picture, water leakage possibility is high. 2. When assembling and disassembling Assy Thermistor , rubber Packing should be checked. If the gap existed between rubber packing and tub- back, water leakage possibility is high.

Part	Figure	Description
Disassembling and Repairing the Cover-T.C		1. Remove the 2 screws, which are at the back, fixing the COVER-TC
		2. Grab the hook and lift it up.
		3. It is easily disassembled when lifted at the same time as LID-T.C
Disassembling and Repairing the Water Supply Valve		1. Disconnect the connector connected to the Waver valve.Open the lid and remove the connector connected to EMI-FILTER.
		2. Remove 9 SCREW
		3. Use the tool to remove 6 points of the clip and separate the water valve

Part	Figure	Description
Disassembling and Repairing the Water Level Sensor -Upper washer		1. Disassemble COVER-T.C.
		2. Remove the level sensor from the assembly.
		3. Remove Clamp as shown in the picture and remove hose.
Disassembling and Repairing the Water Level Sensor -Lower washer		1. Remove FRAME FRONT.
		2. Press the Hook part as shown to separate It from the FRAME PLATE.
		3. Remove the Clamp as shown Separate hose.

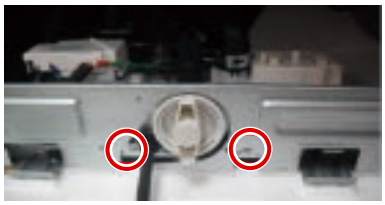
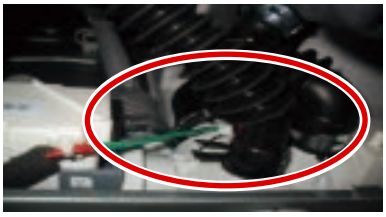
Part	Figure	Description
Disassembling the LID-T.C & COVER-TOP FRONT		1. Open Lid-tc and remove 2 screws on each side
		2. Lift the door up with both hands and remove it.
		3. Remove the Assy lid t.c low after separating Frame and Assy lid t.c assembly hook using a flat screwdriver as shown in the figure.
		4. Remove the cover detergent, cover rinse by lifting up as shown.
		5. Using the driver as shownRemove cover top fron.

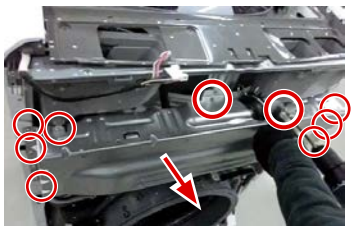
Part	Figure	Description
Disassembling the CONTROL PANEL		1. Remove 3 screws for panel separation
		2. After removing the screw, pull the panel forward and remove it
		3. Disconnect the connector as shown.
Disassembling the COVER TOP-DECO		1. Remove cover rinse and cover detergent with driver.
		2. Remove hose and cover detergent after removing clamp as shown
		3. Lift up the cover top as shown in the figure.

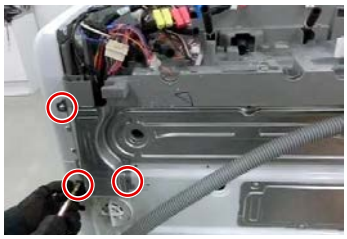
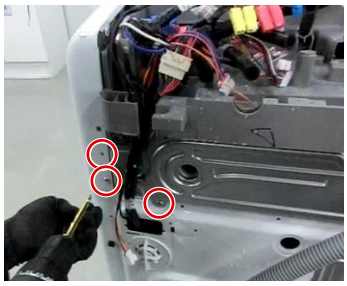
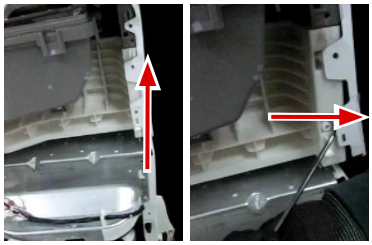
Part	Figure	Description
Separating the Main PCB		1. Remove the 2 screws holding the ASSY PCB-MAIN at the back of the washing machine.
		2. Separate the 2 Hooks by pushing it rightwards.
		3. Remove the 2 screw and 2 Connectors for separating Guide Wire-T
		4. Push the TUB upside to separate ASSY PCB-MAIN. and separate the ASSY PCB-MAIN lifting it up.
		5. Separate the 4 Hooks.
		6. Disconnect All Connectors on main PBA. Lift up Main PBA, Change SVC Part. After SVC, Certainly check the all Hooks on COVER-PCB(M) Otherwise COVER-PCB(M) will be disassembled during washing machine running.

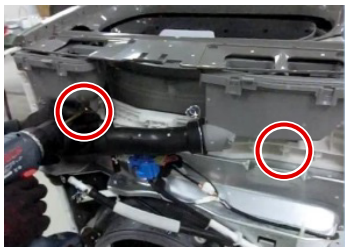
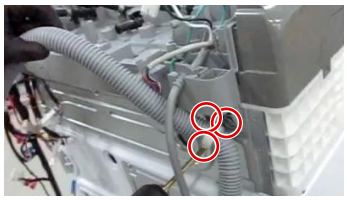
Part	Figure	Description
Disassembling and Reassembling the Door Part		1. Remove the 2 hexagonal screw holding the hinge door.
		2. Putting and pressing hard a flat-head screwdriver or into the furrow between COVER-FILTER and FRAME-FRONT and then pull it towards to open the COVER-FILTER.
		3. Remove the screw holding the cover filter.
		5. Separate the Connector of assy wire harness.

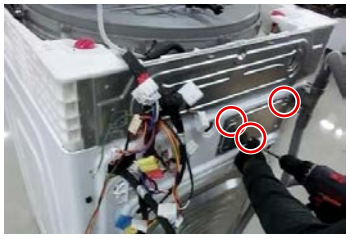
Part	Figure	Description
Disassembling the Front Cover/Frame Front (Check the Door Lock S/W)		1. Pull the DIAPHRAGM upside, and finish disassembling along the circle.
		2. Remove the 2 screws to separate the DOOR LOCK S/W.
		3. Remove the 5 screws at the top of FRAME-FRONT.
		4. Push the lever and pull it towards to open the COVER-FILTER.
		5. Separate the remaining WATER REMOVAL HOSE (BLUE) from the hook.
		6. Remove the 2 screw down under Frame Front.
		7. Press the UPPER-PLATE slightly with the screwdriver to separate the FRAME-FRONT.

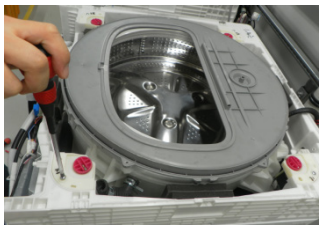
Part	Figure	Description
Disassembling the Pump Motor Part		1. Remove the 2 screws holding the ASSY PUMP DRAIN.
		2. Separate the Clamp of the hose connected to the PUMP and then pull the DRAIN-HOSE. 3. Separate the Clamp of the hose connected to the PUMP and then pull the HOSE-AIR. 4. Separate the Clamp of the hose connected to the PUMP and then pull the HOSE-DRAIN.
		5. Separate the wire connected to the PUMP.
Removing the Remaining Water		1. If the washing machine works, drain the water in the wash tub by selecting the Spin course. If the washing machine does not work, remove the laundry from the wash tub and scoop the remaining water out of the tub using a cup.

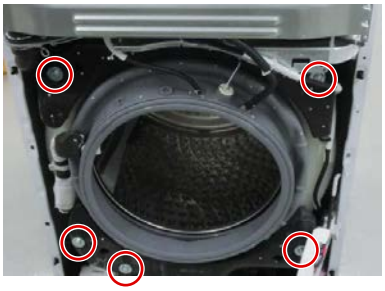
Part	Figure	Description
Disassembling the Assy basket & tub of Upper washer		1. Open the door and remove the diaphragm as shown.
		2. Remove 3 screws and detach Door lock s/w.
		3. Tilt the set slightly backwardsRemove two screws at the bottom.
		4. Remove 4 screws at the top of the frame front.
		5. Use the tool to detach the two hooks, then move the frame front forward Pull it off.
		6. Remove 9 screws and disassemble by pulling the part forward.
		7. Remove the four screws and pull the part forward to remove it.

Part	Figure	Description
Disassembling the Assy basket & tub of Upper washer		8. After removing one screw, pull the part forward to remove it.
		9. For top frame-right disassembly, remove the three parts of SCREW on the upper left side of the rear panel.
		10. Remove 3 Screws on the back.
		11. Remove 3 screws inside Frame Right.
		12. Lift the upper assy cover top slightly, then remove the hook using a screwdriver and remove the part.
		13. Separate in the same direction as the picture.

Part	Figure	Description
Disassembling the Assy basket & tub of Upper washer		14. Remove the holder and detach the hose.
		15. Use tool to remove clamp and separate hose.
		16. Separate the assembly screws of detergent and rinse cups.
		17. Remove three screws on each side of the left and right sides.
		18. Drain hose assembly area screw included Separate 3 Screws.
		19. Left Earth wire assembly screw included Remove 2 Screws.
		20. Lift the upper assy and remove the clamp to separate the hose.

Part	Figure	Description
Disassembling the Assy basket & tub of Upper washer		21. Remove 3 Screws.
		22. Remove the clamp first to separate the hose connected to the pump drain. ⚠ CAUTION When removing the hose, please be careful because residual water may come out.
		23. Use the tool to remove the wire bundles assembled into the frame.
		24. Remove the four screws and lift up the assy basket.

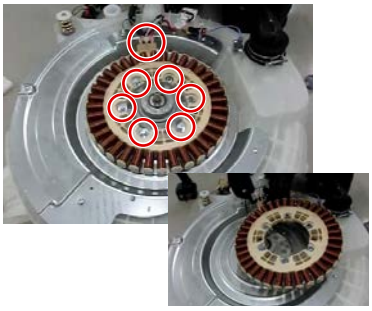
Part	Figure	Description
Disassembling and Repairing the Damper -Upper washer		1. Disassemble 4 screws.
		2. Lift up ASSY BASKER andDAMPER at the same time.
		3. Remove the damper by lifting It up, Separate from CORNER FRAME.

Part	Figure	Description
Disassembling the TUB of Lower washer		1. Remove the 5 bolts fixing WEIGHT BALANCER and then pull it towards with caution.
		2. Remove the 4 bolts fixing DAMPER to take ASSY TUB out. 3. Remove all wire and hose connected the ASSY-TUB.
		4. Open the cap of SPRING-HANGER to take ASSY-TUB out.
		5. Lift the ASSY-TUB with two people carefully with holding SPRING-HANGER.
		6. Remove the M10 bolt from the middle of the TUB and separate the TUB-FRONT and TUB-BACK.

Part	Figure	Description
Separating the Heater at the Bottom Front		1. Disassemble the Front-Frame. 2. Separate the connection wire. - Separate the Thermostat fixed at the bottom of the Tub. (Take precaution as there may be water remaining.) Make sure to separate the Thermostat first and then separate the Heater. If you fail to observe this order, it may result in a shock and be damaged. 3. Release the nut holding the Heater with an M10 tool and then separate the Heater. Do not completely release the nut. Pull the Heater forward after releasing the nut. If the Heater is damaged, it may cause a problem. Therefore unfasten the nut using spanner or wrench manually without using pincers or tweezers. ⚠ When you re-assembly the heater, make sure to install the Heater exactly onto the Bracket inside the Tub. If it is not properly installed, it may cause a fire. In addition, completely insert the packing part into the Tub when assembling it so that the packing part is completely attached onto the Tub.
	* **Check Points for Troubleshooting** 1. Check if the resistance of the Heater is equal to 27.1Ω (for the 1900W product), or 26.2Ω (for the 2000W product). 2. Check if the resistance of the Thermistor is equal to 12kΩ (at room temperature).	

Reassembly is in the reverse order of the removal.

Part	Figure	Description
Disassembling the MEMS Sensor		1. Remove HOLDER and disconnect HOSE.
		2. Disconnect the connector
		3. To facilitate disassembly of the MEMS SENSOR, pull the tub toward the front as shown in the picture.
		4. Remove two screws and detach the MEMS sensor.

Part	Figure	Description
Disassembling the COVER TUB		1. Remove 6 Screws.
		2. Use a screwdriver to detach the 5 hooks and lift up the Cover-Tub.
Disassembling the BLDC MOTOR		1. Separate one bolt and open COVER.
		2. Remove connector and remove 6 bolts.

4. TROUBLESHOOTING

4-1. ERROR MODES

▶ **This is a washer integrated error mode. For detailed information, refer to the general repair scripts.**

Error Type	Code		Causes	Remarks
	Upper washer	Lower washer		
Water Level Sensor	11C	1C	- The part of the hose where the water level sensor is located is damaged (punctured). - The hose is clogged with foreign material. - The hose is folded. - Too much lubricant has been applied to the insertion part of the air hose. - Hose engagement error. (disengaged) - Part fault. (Faulty internal soldering) - The water level sensor terminal is disengaged. - Main PBA fault.	
Motor Driving Error and Hall Sensor Error	13C	3C	- The PBA connector terminal is not connected. - The motor spin net is not engaged. - The motor's internal coil is damaged. (short-circuited or cut) - The hall sensor terminal is not connected. - Foreign material (a screw) has entered the motor. - Motor overloaded due to too much laundry. (Non-sensing) - The motor hall sensor terminal is not connected. - PBA fault. - The motor driving error from the PBA is weak. Unstable relay operation, etc. - This occurs due to erroneous operating signals from the motor hall sensor. - The IPM terminal of the main PBA is not connected. - The DD motor cover is out of place. - The PCB housing terminal is not connected. - PBA fault. - DD motor fault.	This error occurs because of restrained revolutions. This error occurs when an interference is generated due to too much laundry, etc.
Water Supply Error	14C	4C	- Foreign material is entering the water supply valve. - The water supply valve terminal is not connected. (Wire disconnected) - The warm water and rinse connectors are wrongly connected to each other. - This occurs if the PCB terminal from the drain hose to the detergent drawer is not connected. Check whether the transparent hose is folded or torn.	
	14C2	4C2	- The cold and warm water supply hoses are wrongly engaged into each other. - The water temperature is sensed as higher than 50 ˚C in the Wool or Lingerie courses.	

Error Type	Code		Causes	Remarks
	Upper washer	Lower washer		
Drain Error	1 5C	5C	- The pump motor impeller is damaged internally. - The wrong voltage is supplied to the parts. - Part fault. - This occurs due to freezing in the winter season. - The drain hose is clogged. (Injection error, foreign material) - Clogged with foreign material. - The water pump terminal is not connected: rubber band, bills, cotton, hair pins, coins have collected inside the drain pump ASSY.	
Power Error	19C1 19C2	9C1 9C2	- Check the consumer's power conditions. : Make sure to check the operating voltage. Connect a tester to the internal power terminals during the Boil operations and observe the washing machine's operation carefully. : Check the voltages. (An error occurs when under or over voltage is supplied.) : Check whether a plug receptacle is used. When the connecting wire is 1m, a momentary low voltage may drop up to 10 V - Main PBA fault (sometimes)	
Communication Error	1 AC	AC	- The signals between the sub and main PBAs are not sensed because of commuication error. - Check the connector connections between the sub and main PBAs carefully. → Check for incorrect or loose connections, etc. - Remove the sub PBA C/Panel and check for any faulty soldering.	
	1AC4	AC4	- The signals between The WIFI Module and main PBAs are not sensed because of commuication error. - Check The connector connections between The WIFI Module and main PBAs carefully. → Check for incorrect or loose connections, etc. - Remove the WIFI Module and Check for any faulty soldering.	

Error Type	Code		Causes	Remarks
	Upper washer	Lower washer		
Communication Error	1AC6	AC6	- The signals between the Inverter PBA and main PBA are not sensed because of communication error. - Check The connector connections between the Inverter PBA and main PBA carefully. → Check for incorrect or loose connections, etc. - Remove the Inverter PBA and Check for any faulty soldering.	
	1AC7	AC7	- The signals between the main PBA with Upper washer and main PBA with Lower washer are not sensed because of communication error. - Check The connector connections between the main PBA with Upper washer and main PBA with Lower washer carefully. → Check for incorrect or loose connections, etc. - Remove the Inverter PBA and Check for any faulty soldering.	
Switch Error (Main Relay Error)	1BC2	BC2	- A switch is jammed or stuck due to be pressed unevenly due to deformation of the control panel or button. - This error may occur when the screws that hold the sub PBA in place are tightened too much. - A button other than the Power button is continually pressed. (for more than 30 seconds). - Deformation of an internal plastic injection part. - A screw for assembling the sub PBA is tightened too much.	
Door Error	1 DC	DC	- A switch contact error because of a deformation of the door hook. - When the door is pulled by force.	When the door is not opened after the door open operation.
			- This occurs in the Boil wash because the door is pushed due to a pressure difference from internal temperature changes.	When the door is not locked after the door close operation.
	1DC1	DC1	- The door lock switch terminal is connected incorrectly. - The door lock switch terminal is broken. - This occurs intermittently because of an electric wire leakage - Main PCB fault.	
	1DC4	-	- Check whether the door of the upper washer is open.	

Error Type	Code		Causes	Remarks
	Upper washer	Lower washer		
Heater Error	-	HC HC1	- The washing heater is short-circuited or has a wire disconnected. - The washing heater in the tub has an error. (Contact error, temperature sensor fault) - If the water level sensor operates without water because water is frozen or for any other reason and the temperature sensor engaged at the bottom to prevent overheating for the washing heater detects a temperature of 100 to 150 ˚C, the washing machine turns the input power off.	If the heater has no error, this occurs because of a PBA relay malfunction.
Water Leakage Error	1 LC	LC	- Heater engagement fault. (out of place) - The air hose is out of place and water leakage occurs during the spin cycle. - The tub back at the safety bolts fixing part is broken. - Water leakage occurs at the front with foaming because of too much detergent. - Water leakage occurs because the connecting hose to the detergent drawer is connected incorrectly. - The drain pump filter cover is engaged incorrectly. - Water leakage occurs at the drain hose. - The duct condensing holding screws are worn. - The nozzle-diaphragm is engaged in the opposite direction or the rubber packaging is omitted. - Water leakage occurs because the screws that hold the tub back and front in place are fastened incorrectly. - The leakage sensor is faulty.	
	1LC1	LC1	- Check that the detergent / softener / bleach has overflowed the detergent case. - Check if the exterior of upper washer is cleaned with water.	
Overflow Error	1 OC	OC	- Water is supplied continually because the water level detection does not work. - Because the drain hose is clogged and there is an injection error (at a narrow section), the water level detection does not work and water is supplied continually. - Water is supplied continually because of freezing or because there is foreign material in the water supply valve. - This error may occur when the water level sensor is degraded.	This error occurs because the water level sensor terminal is out of place.

Error Type	Code		Causes	Remarks
	Upper washer	Lower washer		
Temperature Sensor Error	1TC1	TC1	- The washing heater sensor in the tub has an error. (Contact error or temperature sensor fault) - The connector is connected incorrectly or is disconnected. - If the water level sensor operates without water because the water is frozen or for any other reason and the temperature sensor engaged at the bottom to prevent overheating for the washing heater detects a temperature of 100 to 150 ˚C, the washing machine turns the input power off.	Heater sensor fault : When the connector is connected incorrectly or has a wire disconnected or contact error
	1TC4	TC4	- Occurs when the temperature of the motor driver in the inverter PBA is high. - Check the inverter PBA	
Unbalance Error	1 UB	UB	- As laundry causes this error, check the laundry. - Find the reason for the unbalance and solve it as directed in the user manual.	
Foaming Detected	1SUD	SUD	- This occurs when too much foaming is detected. It is also displayed while foaming is removed. When the removal is finished, the normal cycle proceeds. "Sud" or "SUdS" is displayed when too much foaming is detected and "0" is displayed when the removal of the foaming is finished. (This is one of the normal operations. It is an error for preventing non-sensing faults.)	
Mems PBA Error Detected	18C1	8C1	- Error detected in the Mems PBA or data error detected. Check the wire connections. Replace if necessary. 1. Check the wire connections. 2. Replace the Mems PBA.	
	18C2	8C2		
	1 8C	8C		
System Error	1 SF	SF	- Micro Controller Operation Fail.	Replace Assy PCB.

4-2. TEST MODES

No	Mode	How to enter
1	Smart Install	Standby → Set the scheduled time to 17:00 → Press Start/Pause for 7 seconds → Smart Install
2	Automatic check mode	Smart Install → Press Start/pause While displaying “AS”.
3	Manual check mode	Enter Smart Install → Press Delay End While displaying “AS” delay end, Check devices in turn when pressing delay end.
4	S/W version Check	Enter Smart Install → Press the first button on the left at the bottom While displaying “AS”.
5	Diagnostic Code Check	Enter Smart Install → Press the first button on the right at the bottom while displaying “AS”, “Cr”. Tum jog dial along the direction for CW when displaying. For models that do not feature the jog dial, press the 3rd button from the bottom left to display the information codes one by one by one with the latest first.

Automatic Mode of Smart Install

- Automatically start all operation modes of Smart Install.

Manual Mode of Smart Install

- Under the condition of manual mode, every time when “Delay End” is pressed, next step will be entered.
- Contents like washings, etc. are not allowed in the drum.

1	carry out test for machine door locking	7	carry out test for operation of drainage pump
2	carry out test for drainage pump operation	8	carry out test for operation of dehydration
3	carry out test for operation of preparatory valve	9	carry out test for operation of drying heater and drying fan
Co	carry out test for operation of cold water valve	10	carry out test for operation of machine door
Ho	carry out test for operation of hot water valve	OK(Ot)	Automatic mode of Smart Install is completed normally
6	carry out test for operation of water shot valve		
	carry out test for operation of washing heater		
	carry out test for operation of rinsing		

※ Accessories not included in the product are not require to check and they can be skipped directly.

Identity of Smart Install completion

- After Smart Install is completed normally, 『OK(Ot)』 identity will display.
- If Smart Install is completed abnormally or Smart Install fails to work, 『nG』 identity will display.

Result Enquiry of Automatic Mode of Smart Install

- Under the condition of appearance of 『AS』 identity, press “Delay End + Start/Pause” button.
- If automatic mode result is in normal condition, 『OK(Ot) identity will display.
  If automatic checking mode fails to complete normally or fails to execute, 『nG』 identity will appear.

Diagnosis Information Display Mode

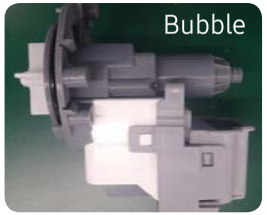
- Under the condition of appearance of 『AS』 identity, if the first button on the right at the bottom is pressed, 『CR』 identity will appear and diagnosis information display mode is entered.
- Under the condition of appearance of 『CR』 identity, of turn the jog dial control switch clockwise, diagnosis codes generated before will display 7 digits at most.

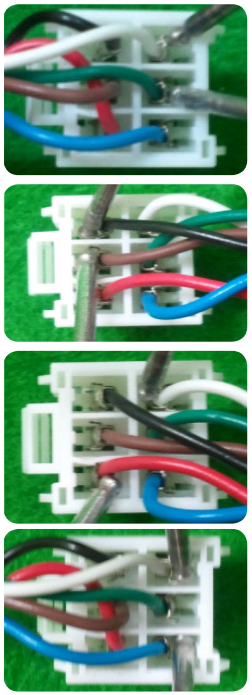
▶ These are common troubleshooting procedures for each drum-type washer error mode. For detailed information, refer to the general repair scripts.

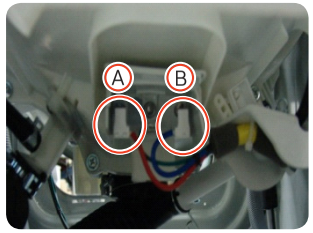
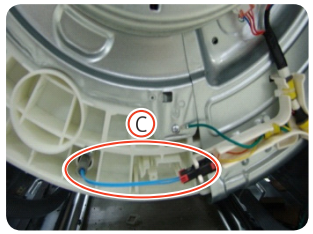
Error Type	Code		Causes	Corrective Actions	Description of Photo
	Upper washer	Lower washer			
Water Level Sensor	11C	1C	• Water level sensor fault • Incorrect connections of the water level sensor terminal • Main PCB fault	• Check the water level sensor terminal connections and contacts. • An error occurs if an incorrect water level sensor is used. Make sure to check the material code. (Abnormal operation) • If the water level sensor is faulty, replace it. • If the error persists despite taking the action above, replace the PBA.	 Check the water level sensor frequency. - Check it after the water level sensor and the connector are connected. Checking Part : Pink Color Wire Orange Color Wire. - Frequency : Approx. 25.3 KHz with no load
Washing Motor Error and Hall Sensor Error	-	3C	• Washing motor fault • Washing motor hall sensor fault • Incorrect connections of the washing motor/hall sensor connector • Washing motor rotor and stator fault • Main PCB fault	• Check the motor connector terminal connections and contacts. • 3C is displayed because overloading occurs due to too much laundry. • If the hall sensor terminal is faulty, replace the hall sensor. • Check whether the stator of the motor cover is damaged. • Check for coil disconnections due to foreign material. • If the PBA control circuit is faulty, replace the PBA.	 ▶ Check the motor Winding Coil Plug out the connector and read resistances at any two of the three terminals on Motor : Should be 10.2 ~ 12.4Ω (at 25°C)
					   ▶ Check the motor Hall Sensor Check the resistance on the main PCB motor (Between pins 2 and 4, and 3 and 4 of the four (4) pins) - Resistance : Approx. 2 to 4 MΩ - Check the voltage when the power is on.

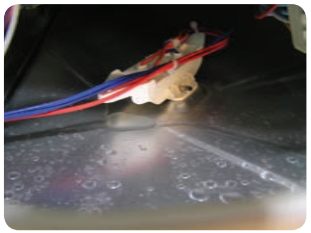
▶ These are common troubleshooting procedures for each drum-type washer error mode. For detailed information, refer to the general repair scripts.

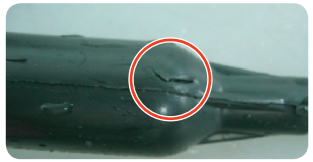
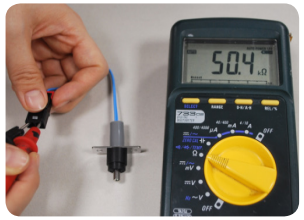
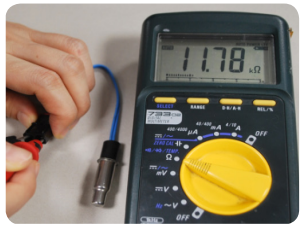
Error Type	Code		Causes	Corrective Actions	Description of Photo
	Upper washer	Lower washer			
Washing Motor Error	1 3C	-	• Washing motor fault • Incorrect connections of the washing motor • Washing motor rotor and stator fault	• Check the motor connector terminal connections and contacts. • 3C is displayed because overloading occurs due to too much laundry. • Check whether the stator of the motor cover is damaged. • Check for coil disconnections due to foreign material.	▶ Check the motor Winding Coil Plug out the connector and read resistances at any two of the three terminals on Motor : Should be 7.6 ~ 8.4Ω (at 25°C)
Water Supply Error	1 4C	4C	• Water supply value fault • Main PCB fault • Freezing in the winter season	• If the water supply valve has a wire disconnected, replace it. • Check whether the water supply valve is clogged with foreign material and whether water is supplied continually. • Check whether no water is supplied because of freezing in the winter season. • If the PBA relay operates abnormally, replace the PBA.	1. Check the resistance for the water supply valve. - Resistance: 0.9~1.1kΩ between the terminals of the water supply valve. 2. Check whether there is foreign material in the water supply valve filter. 3. If the water supply valve filter is clogged, clean filter.

Error Type	Code		Causes	Corrective Actions	Description of Photo
	Upper washer	Lower washer			
Drain Error	1 5C	5C	• Freezing in the winter season • Foreign materials in the drain pump • Poor physical connection • Drain pump fault • Main PCB fault	• If the drain pump revolutions are restrained due to freezing in the winter season, check the method to remove the freezing and remove as directed. • Check whether the revolutions of the drain pump motor are restrained by foreign material, and remove as directed. • Check the wire connectors on Main PCB and Drain Pump ASSY. The connector or wire may have poor physical connection. • Check the drain pump resistance.	 Upper-Washer Check the drain pump resistance - Drain : 13Ω ~ 16.5Ω
					   Lower-Washer Check the drain pump resistance - Drain : 13Ω ~ 16.5Ω - Bubble : 40Ω ~ 50Ω
Communication Error	1 AC	AC	• The signals between the sub and main PBAs are not sensed. • Incorrect wire connections between the sub and main PBAs.	• Check the wire connections and terminal contacts between the sub and main PBAs. • Check for disconnected wires. • Check whether the sub PBA is short-circuited because of moisture. • If the main PBA's communication circuit is faulty, replace it.	-

Error Type	Code		Causes	Corrective Actions	Description of Photo
	Upper washer	Lower washer			
Door Error	1 DC 1DC1	DC DC1	• Door switch fault • Main PCB fault	• If a DC /DC1 error occurs, check whether it occurs during the Boil cycle. - If it is detected that the door is open, close the door. • The 120V is directly connected to the door. Check and repair the power wire connections and insulation state. • Check the door switch. Replace if faulty. • Check the main PBA door sensing circuit. Replace if faulty.	 ▶ TYPE 1 Check the door switch Resistance. The resistance of 1 and 3 Pin Must be approximately 175Ω.
Door Error	1 DC 1DC1	-	• Door-Lock SW fault • Reed SW fault • Main PCB fault	• Check the Door-Lock SW terminal connections and contacts. • Bring the probe of tester into contact with two terminals of Door-Lock SW. • [DC Error] In state of Door Close, Check Reed SW Resistance. • [DC1 Error] In state of Door Lock/Unlock,Check Motor Resistance. And In state of Door Lock/Unlock, Check Door Lock/Unlock Contact Resistance. • If Resistance is satisfied with Spec, Replace the PBA.	 1. Check the resistance for Reed SW (Checking Part : White-Green Wire) - Resistance: Approx 0.2Ω between the terminals of Reed SW. 2. Check the resistance for Motor (Checking Part : Black-Brown Wire) - Resistance: 34Ω to 51Ω between the terminals of Motor. 3. . Check the resistance for Lock/Unlock Contact (Checking Part : Lock White - Red Wire Unlock White - Blue Wire) - Resistance: Approx 0.2Ω between the terminals of Contact. *Check the Door Lock/Unlock state.

Error Type	Code		Causes	Corrective Actions	Description of Photo
	Upper washer	Lower washer			
Door Error	1DC4	-	• Upper washer inner door open	• Check inner door in Upper washer. • Close the door and press the START / PAUSE button Please press.	Check the ASSY SWITCH-TACT Resistance when you press the switch button. The resistance of 2 pin Must be approximately 0~0.3Ω
Heater Error	-	HC HC1	• Disconnection wire • Heater falut • Wash-thermistor fault	• Check for connection between wire and heater. • If wash heater is faulty, replace it. - Refer the TYPE 1 • If it is not problem in heater, replace wash-thermistor - Refer the TYPE 2	 [FRONT] ▶ TYPE 1 Check the resistance between A and B. It should be 16.05±0.65Ω.
					 [BACK] ▶ TYPE 2 If TYPE 1 is OK, Change a wash-thermistor at back of Tub.

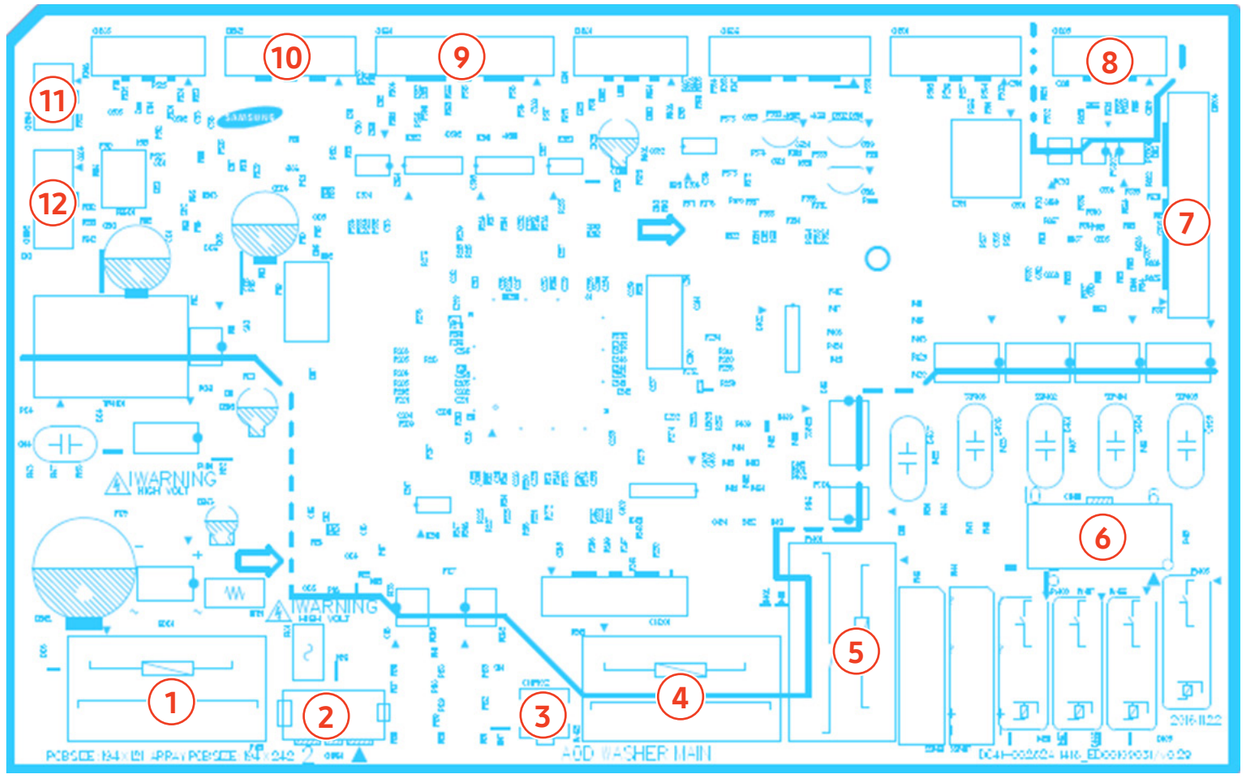
Error Type	Code		Causes	Corrective Actions	Description of Photo
	Upper washer	Lower washer			
Water Leakage Error	1 LC	LC	• Check for any leakage. • Fault of a hose or incorrect part engagement in the product	• Check for any leakage on the base, Hose, Valve and Tub connections and take any required action. • Check the drain motor operation. Replace if it does not operate normally.	 ▶ PUMP TYPE Check for any leakage on the base, Hose, Valve and Tub connections.
	1LC1	LC1	• Check for any leakage. • Check that the detergent / softener / bleach has overflowed the detergent case. • Check if the exterior of washer is cleaned with water.	• Check the drain hose. • Make sure the end of the drain hose is placed on the floor. • Make sure the drain hose is not clogged. • If the information code remains, contact a customer service center.	-

Error Type	Code		Causes	Corrective Actions	Description of Photo
	Upper washer	Lower washer			
Overflow Error	1 OC	OC	• Check that the water supply is continuing. • Water level sensor fault • Freezing in the winter season	• If the water valve faulty, replace the part. • If the water level sensor has a functional error, replace it. • Check the hose. This error occurs if it is torn or has a hole. • This error occurs if water is frozen in the winter season. Use hair dryer to defrost hose. Consider relocating the unit to warmer location.	 Check the hose connected to the water level sensor. ☑ Check whether the hose is folded, cut, or damaged.
Temperature Sensor Error	1TC1	TC1	• Washing temperature sensor fault • Main PCB fault • Freezing in the winter season	• Check the connections for the washing heater temperature sensor connector. • If the washing heater temperature sensor has a functional error, replace it.	  First check the thermistor type And The resistance of thermistor [Type 1] The resistance of 2pin Must be Approximately 40~55kΩ [Type 2] The resistance of 2pin Must be Approximately 10~15kΩ
	1TC4	TC4	• Occurs when the temperature of the motor driver in the inverter PBA is high. • It occurs when the thermistor of IPM is OPEN or SHORT. • Check the inverter PBA	• Upper washer: Replace MAIN PBA. • Lower washer : Replace PBA inverter.	-

Error Type	Code		Causes	Corrective Actions	Description of Photo
	Upper washer	Lower washer			
Unbalance Error	1 UB	UB	• Motor hall sensor fault • Caused by the laundry contents	• Check the type of laundry. Check whether they may cause an unbalanced situat ion. - Educate the consumer in this case is to press pause reposition the load or remove a few items. Press start to continue and complete the wash cycle.	-

5. PCB DIAGRAM

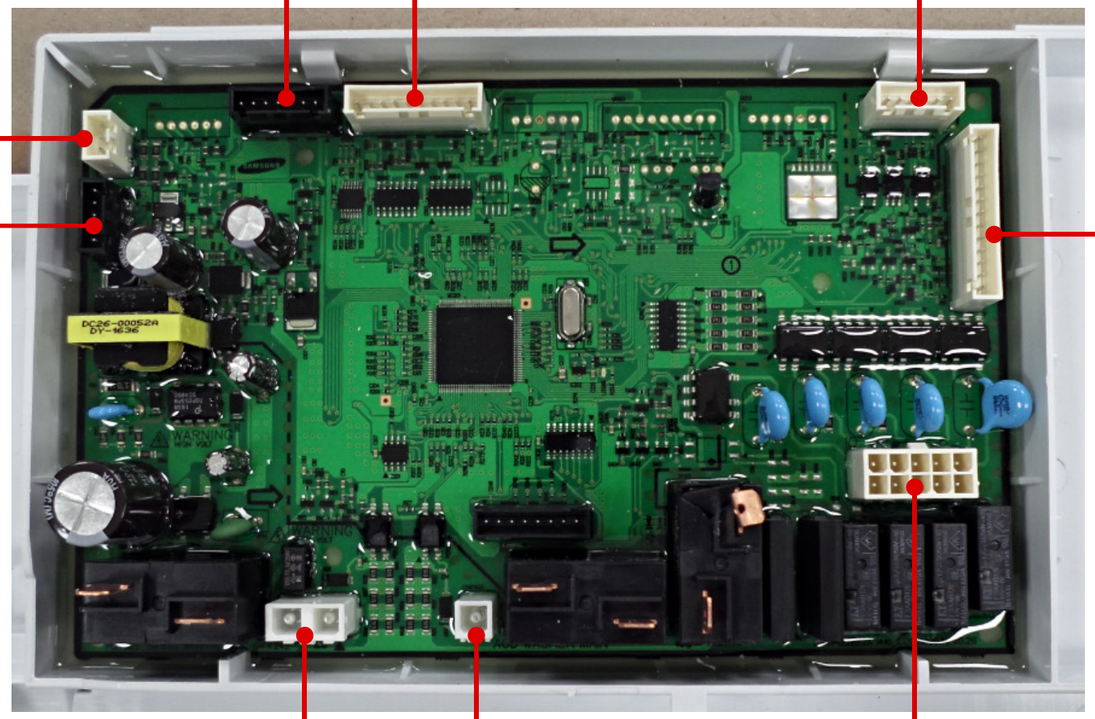
5-1. MAIN PCB



Location	Part No.	Function	Description
1	RY101	PBA Power Supply	Power on/off of inverter PBA
2	CNP101	Power Supply	Supply 120V of AC power.
3	CNP102	Power Supply	Supply power to ac load only door lock state
4	RY402	Washing Heater Relay	Power on/off of wash heater
5	RY401	Upper washer Relay	Power on/off of upper washer
6	CN401	AC load connector	The port to supply power for each AC load

Location	Part No.	Function	Description
7	CN804	DISPLAY and INVERTE PBA communication	Supply power and communicate with the display and Inverter PBA.
8	CN803	Upper washer PBA communication	Supply power and communicate with upper washer PBA.
9	CN501	Sensor connector	Sensing of door open/close, water temp and water level.
10	CN502	MEMS communication	Supply power and communicate with Mems sensor.
11	CN304	Drum light	On/off of drum light
12	CN802	Flash Writing Port	writing Flash memory.

5-2. CIRCUIT DIAGRAMS OF MAIN PARTS FOR MAIN PBA



▶ CN502
1. 3.3V
2. CS1
4. SDO
5. SPI
6. SPC
7. GND

▶ CN501
1. GND
2. DOOR_SW
6. WATER_LV_OUT_FWM
7. WATER_LV_IN_FWM
8. WATER_LV_OUT_OWM
9. WATER_LV_IN_OWM

▶ CN803
1. 5V
2. TX_OWM
3. RX_OWM
4. GND
5. WATERLEVEL_TO_OWM_MAIN

▶ CN304
1. 12V
3. DRUM_LIGHT

▶ CN804
1. RX_DISPLAY
2. TX_DISPLAY
3. DISPLAY_RESET
4. 5V
5. GND
6. 12V
7. 12V
8. POWER_SW_FWM
9. POWER_SW_OWM
10. 5V
11. TX_INV
12. RX_INV
13. GND

▶ CN802
1. 5V
2. RX_SMART_TEST
3. TX_SMART_TEST
4. GND
5. MODE0

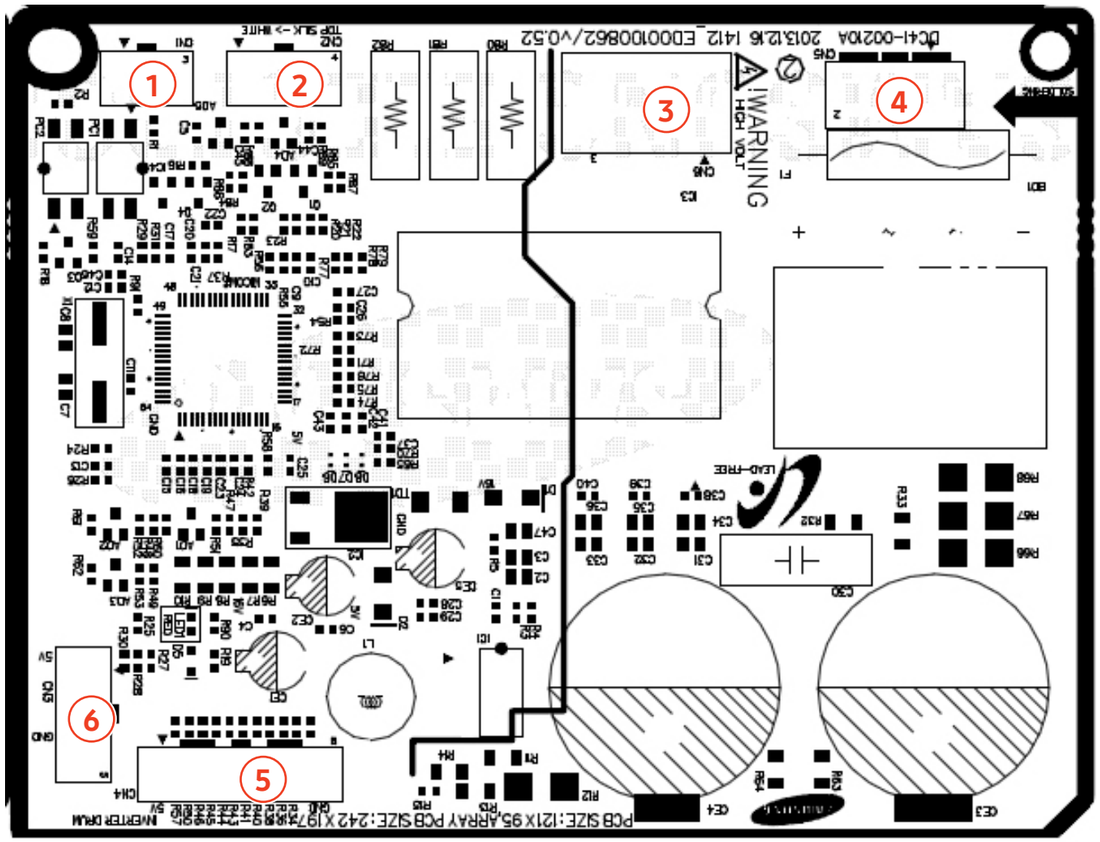
▶ CNP101
2. LI_IN

▶ CNP102
1. D_LOCK/UNLOCK

▶ CN401
1. DRAIN_PUMP
2. CIRCULATION_PUMP
3. DOOR_UNLOCK
4. DOOR_LOCK
5. THERMO_ACTUATOR
6. COLD_VALVE
7. HOT_VALVE
8. BLEACH_VALVE
9. SOFTNER_VALVE
10. WATER_SHOT

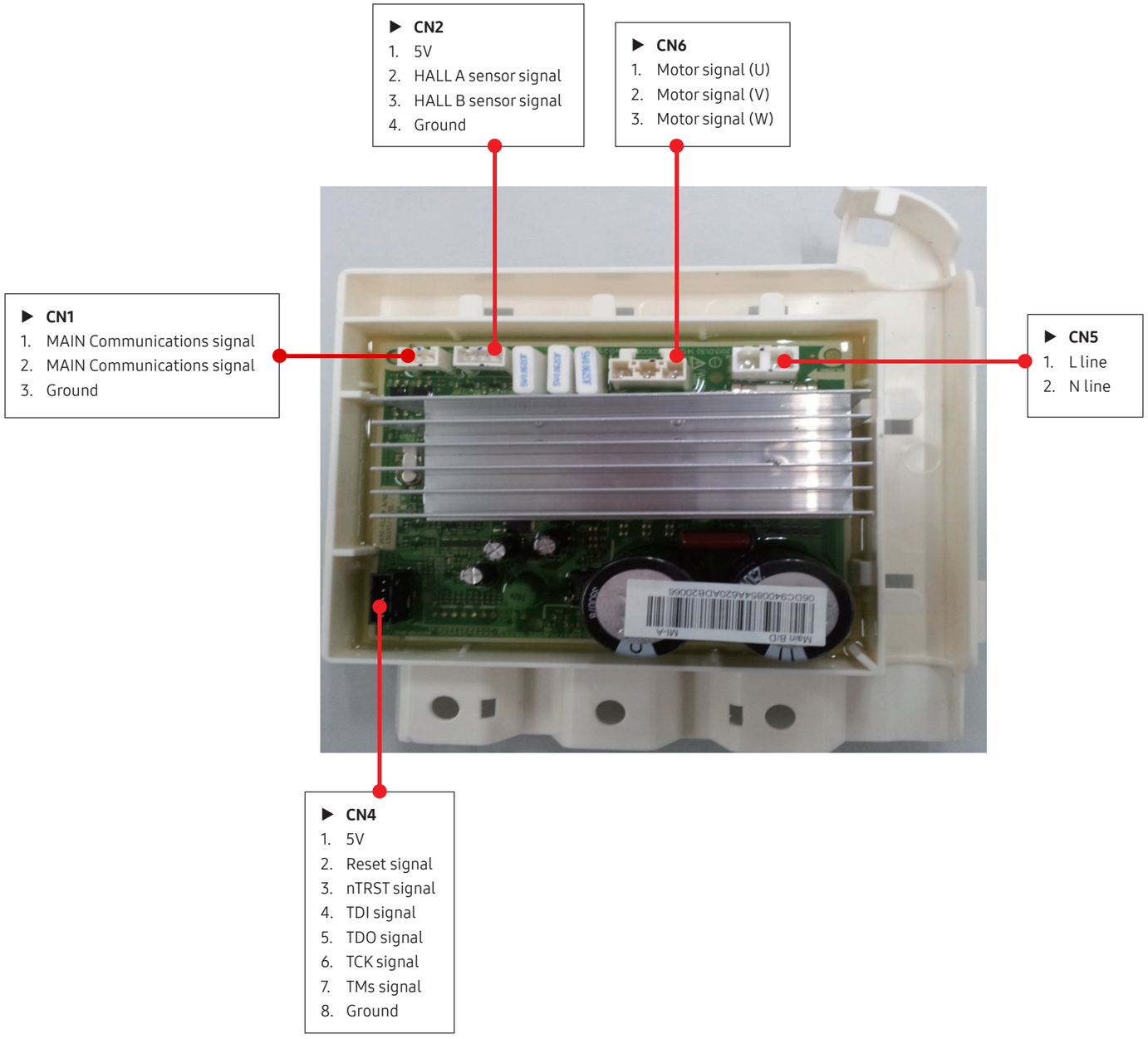
PIN Location				
10	9	8	7	6
5	4	3	2	1

5-3 INVERTER PCB

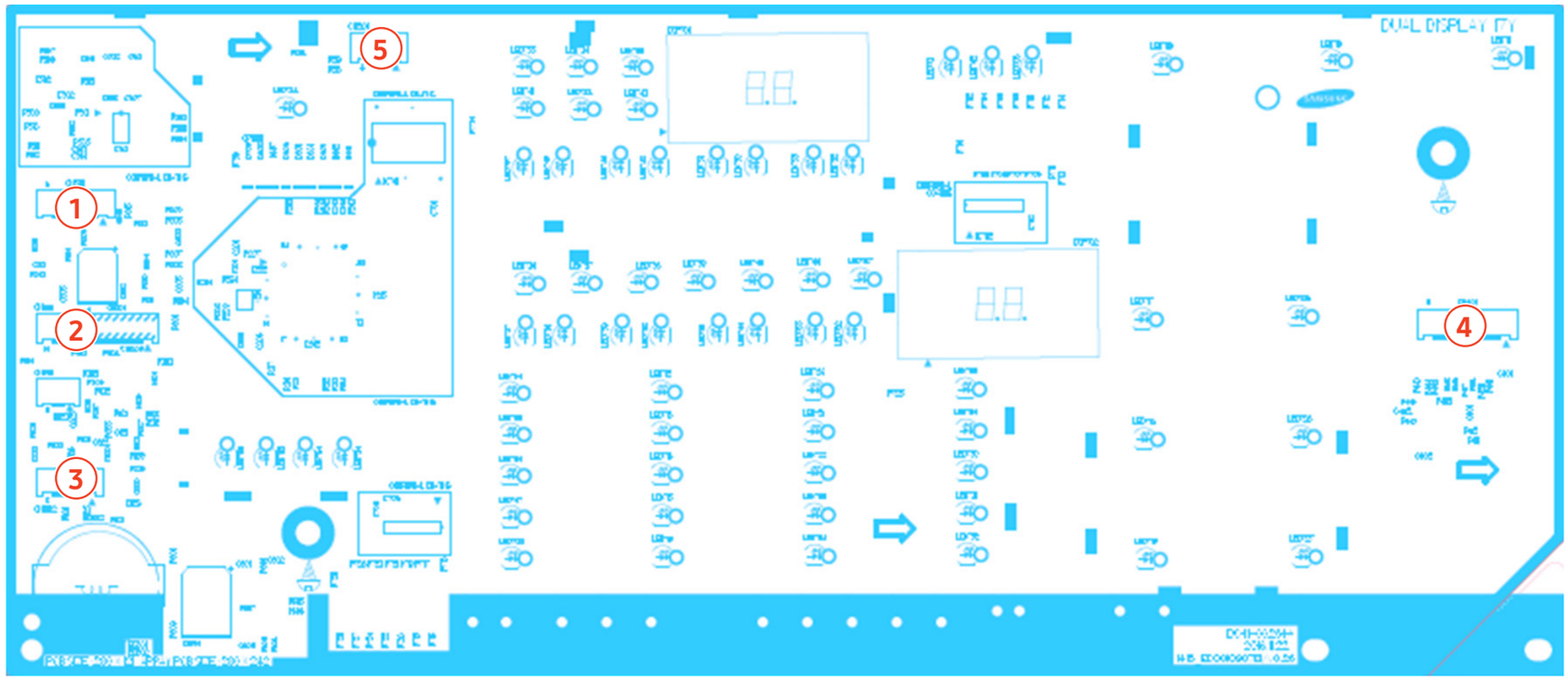


Location	Part No.	Function	Description
1	CN1	Communication	Communication with MAIN
2	CN2	Hall Sensor	Sensing Hall signal
3	CN6	Motor Output	MOTOR 3-Phase Output
4	CN5	AC Power Source	Supply AC Power
5	CN4	JTAG Connector	Debugging connector (Deleted in massproduction)
6	CN3	Flash Writing Port	Writing Flash memory

5-4. CIRCUIT DIAGRAMS OF MAIN PARTS FOR INVERTER PBA

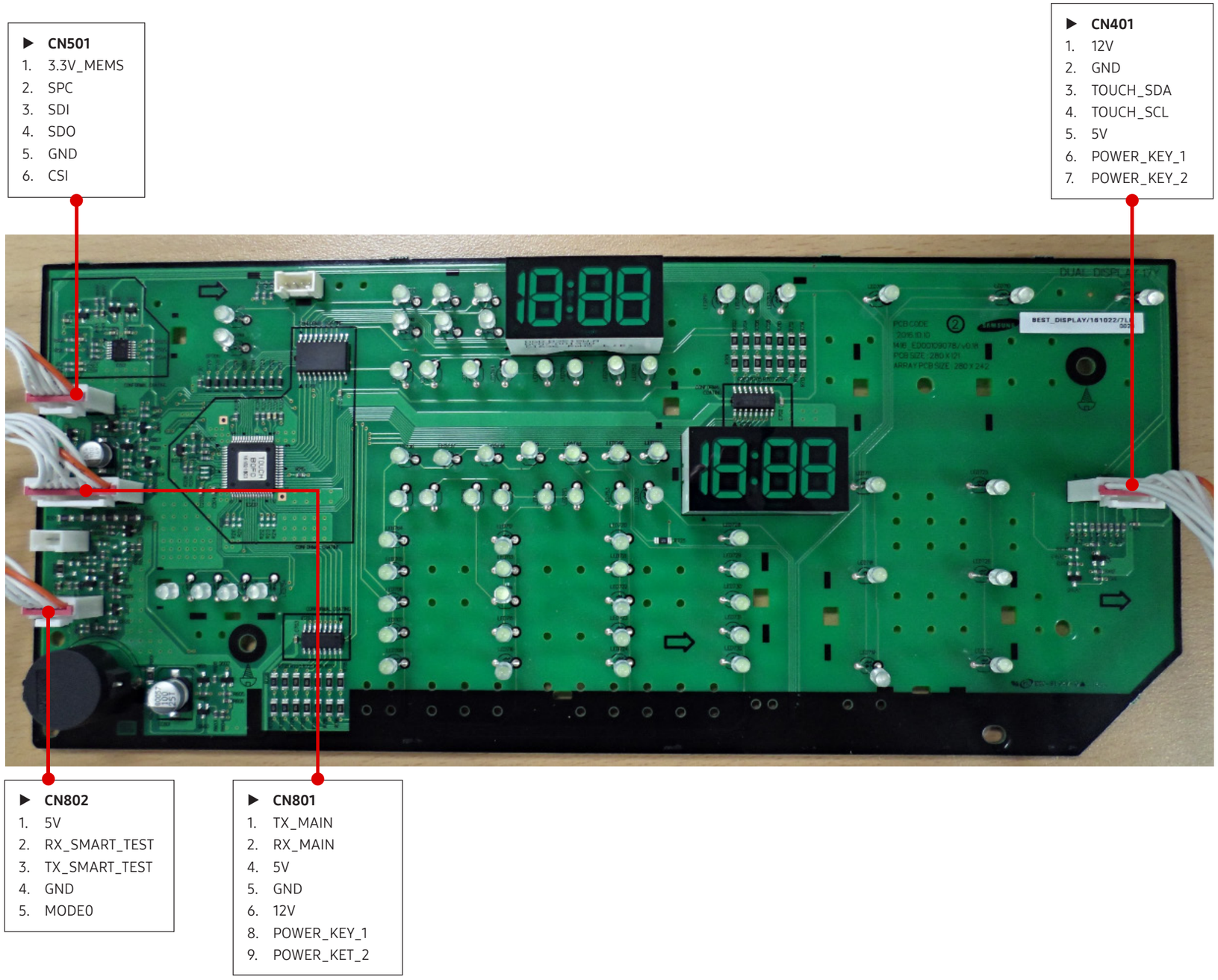


5-5. DISPLAY PCB

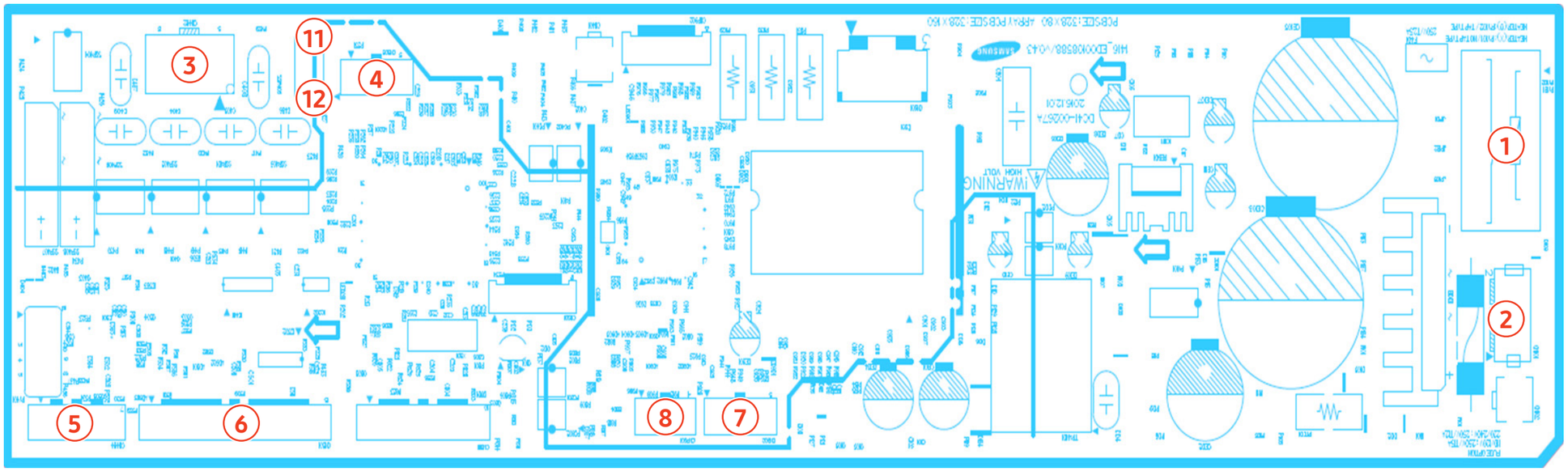


Location	Part No.	Function	Description
1	CN501	MEMS communication	Supply power and communicate with Mems sensor.
2	CN801	MAIN PBA communication	Supply power and communicate with MAIN PBA.
3	CN802	Wi-Fi communication	Supply power and communicate with Wi-Fi.
4	CN401	Touch communication	Supply power and communicate with Touch.
5	CN201	Flash Writing Port	writing Flash memory.

5-6. CIRCUIT DIAGRAMS OF MAIN PARTS FOR DISPLAY PBA



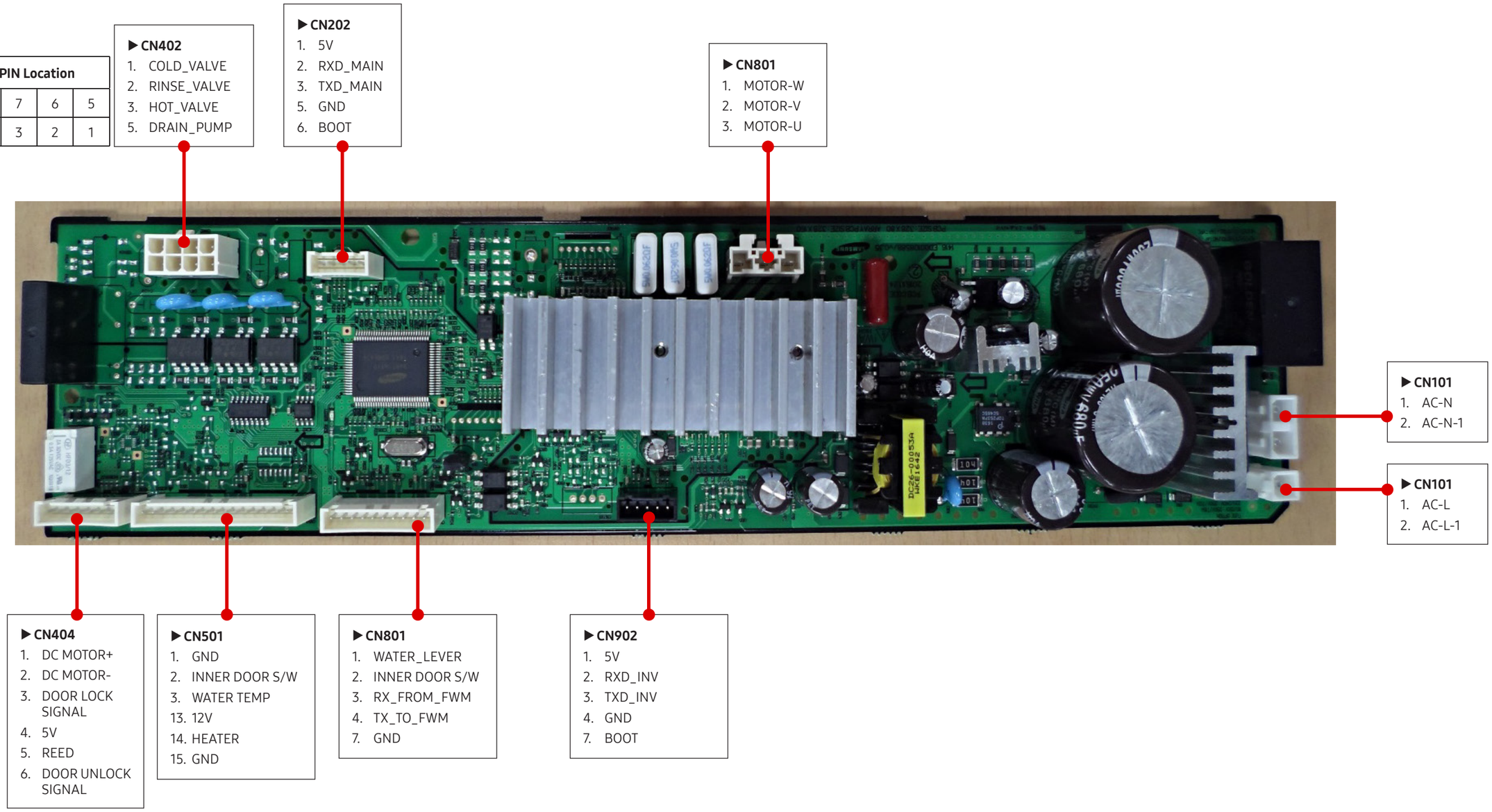
5-7. UPPER WASHER MAIN PCB



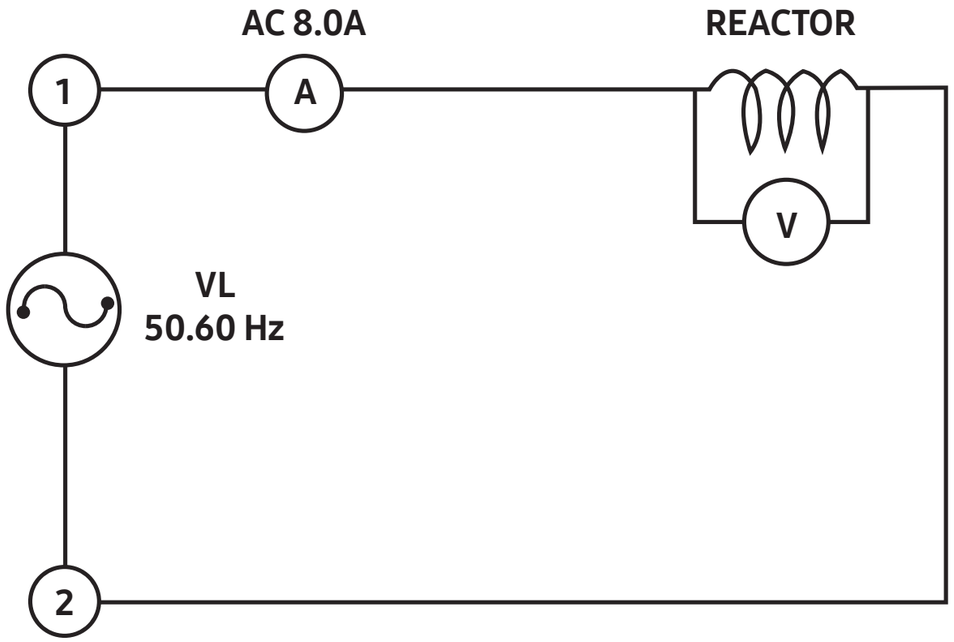
Location	Part No.	Function	Description
1	RY101	Main Relay	Power on/off of inverter PBA
2	CN101 CN102	Power Supply	Supply 120V of AC power.
3	CN402	AC load connector	The port to supply power for each AC load
4	CN803	Front washer PBA communication	Communicate with Front washer PBA.
5	CN404	DC DoorLcok onnector	Control the DC DoorLock open/close.
6	CN501	Sensing Connector	Sensing of water temp and Inner door Open/Close..
7	CN202	Flash Writing Port	writing Flash memory.(MAIN)
8	CN902	Flash Writing Port	writing Flash memory.(INVETER)

5-8. CIRCUIT DIAGRAMS OF MAIN PARTS FOR UPPER WASHER MAIN PBA

PIN Location			
8	7	6	5
4	3	2	1



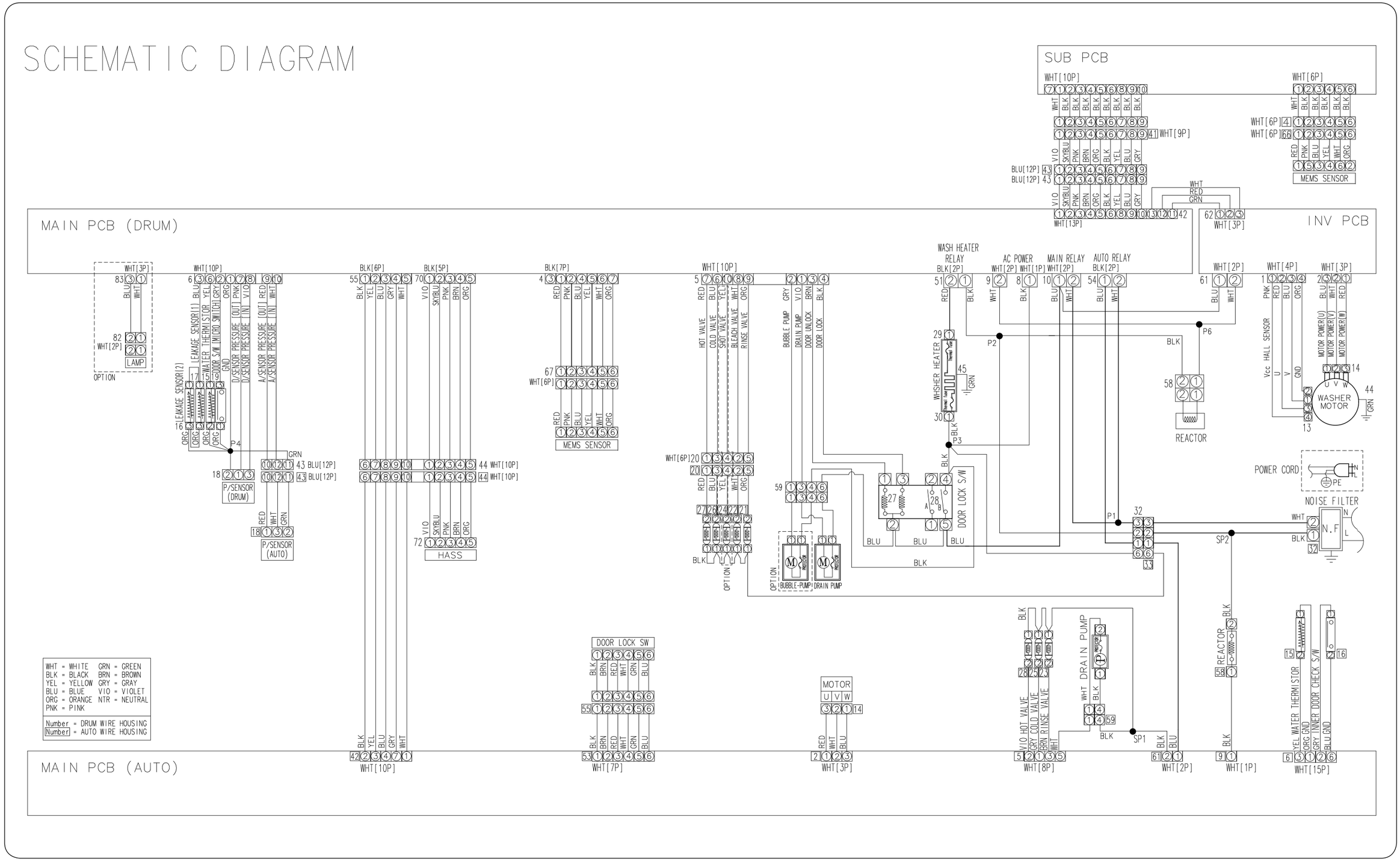
5-9. SCHECMATIC DIAGRAM OF REACTOR & INFO



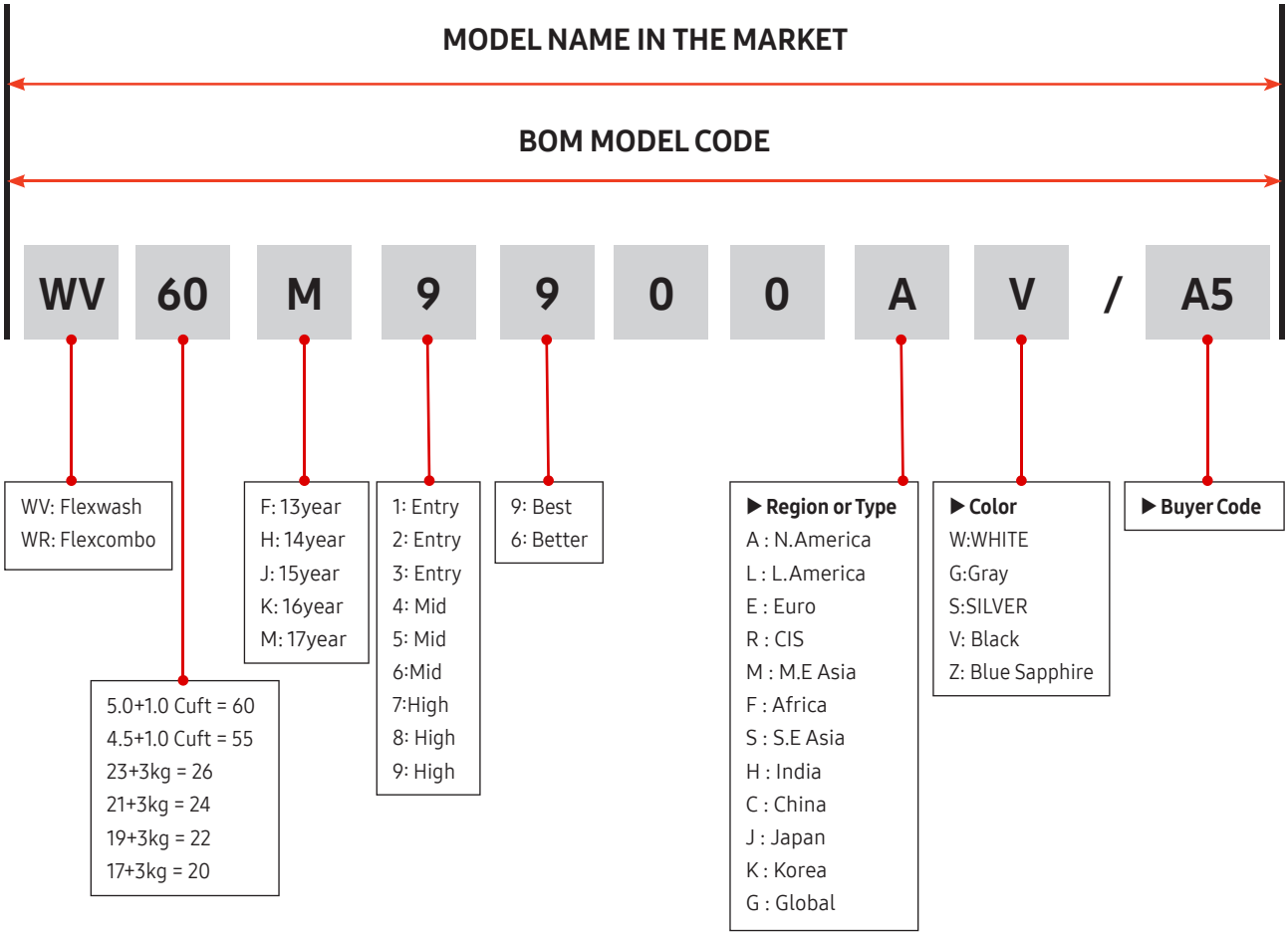
Remarks InpuT	Lead No or color	Rated Current
1---2	WHT-WHT	-
1---2	WHT-WHT	AC 8.0A
1---2	WHT-WHT	AC 8.0A

WINDING ORDER	SYMBOL	TERMINAL NO	WIRE	TURNS	WINDING METHOD	REMARKS
W1	L1	S - F	PEW 1.4ϕ	54	SOLENOID	

6-1. WIRING DIAGRAM_ WV60M9900A*



7. REFERENCE


MODEL NAME IN THE MARKET
BOM MODEL CODE
WV 60 M 9 9 0 0 A V / A5
WV: Flexwash
WR: Flexcombo
5.0+1.0 Cuft = 60
4.5+1.0 Cuft = 55
23+3kg = 26
21+3kg = 24
19+3kg = 22
17+3kg = 20
F: 13year
H: 14year
J: 15year
K: 16year
M: 17year
1: Entry
2: Entry
3: Entry
4: Mid
5: Mid
6:Mid
7:High
8: High
9: High
9: Best
6: Better
▶ Region or Type
A : N.America
L : L.America
E : Euro
R : CIS
M : M.E Asia
F : Africa
S : S.E Asia
H : India
C : China
J : Japan
K : Korea
G : Global
▶ Color
W:WHITE
G:Gray
S:SILVER
V: Black
Z: Blue Sapphire
▶ Buyer Code

SAMSUNG

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